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THE QUARTERLY REVIEW OF COMMERCE



A New Understanding of Airpower

E. G. Carlisle

Is the West Ready For Tomorrow?

A. N. Mitchell

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What the Future Holds For Retailers

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Management Must Co-operate

J. J. McHale

Retail Mortality, London, Ontario

R. B. Willis

Volume X

No. 3

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THE QUARTERLY REVIEW OF COMMERCE



PHASES OF '44

On the basis of the general expectation that the year 1944 will see an end to the fighting in Europe, several trends in Canadian business may be predicted.

War contracts will gradually taper off and release a few of the durable goods industries for the production of domestic needs. The goods produced will still be along simplified lines and pre-war models will reappear in small quantities. Reconciling the high wages paid in war industries to the prices of goods under the price ceilings will mean a reduction in the general level of wages in certain areas.

The year of major changes in industry is not to be 1944, and the people must be alert to the danger of extending this war, our war, through the indifference of public attitude toward the battle of production. **KEEP FIGHTING!**

—J. B. B.

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THE QUARTERLY REVIEW OF COMMERCE

VOLUME X



NUMBER 3

1944

A NEW UNDERSTANDING OF AIRPOWER

E. G. CARLISLE

Superintendent, Flight Research, Canadian Pacific Air Lines Limited
The New Understanding of Airpower

AFTER four years of war there is emerging an understanding of airpower's dual aspect—airpower, the weapon of war, and airpower, the tool of peace.

With the development of this understanding, the distorted fear and apprehensive feeling that the air space of one nation must be used only in a highly restrictive and limited manner by another nation will tend to dissipate.

In theory, military airpower is fundamentally like any other power. True protection against any kind of offensive power can be developed only if there exists a state of mind willing to admit the ingenuity and ability of the potential aggressor and able to assess the true aims and intentions of the aggressor. When one civilization suddenly looms on the horizon of another civilization with an offensive technique strange and unknown to the defenders the outcome of the ensuing battle generally depends upon the time allotted to the defenders and their ability to react within this allotted time.

Because the Allied Nations had had so large a hand in the invention and development of man's ability to fly and because technical improve-

ments basic to the art of flying continued at a rapid pace, it was not until the enemy had overrun Europe that a full realization of his insidious intentions and design techniques came to light. The new technique of aerial warfare spearheaded blows that reduced one nation after another. Although eventually countered, this technique left the balance of the world suffering from a kind of aerial shell shock that now threatens to react to the detriment of any kind of airpower.

Pre-War Civil Airpower

Prior to the opening of hostilities, airpower as a force for promoting the peaceful aims of trade and commerce within and between nations had only just penetrated the consciousness of the average citizen. The United States was generally credited with having the best domestic airline development and here the basic principles guiding the relationship between government and the airline organization for successful promotion of this new type of enterprise were only just emerging. On the basis of statistics portraying services rendered, such as ton-miles of goods carried, passenger miles, etc., airlines are still miniscule as compared with other forms of transportation, particularly as compared with the railroads. On a dollar volume of business performed, however, at the outbreak of hostilities one or two United States airlines were commencing to rate well in comparison with the larger railroad organizations so far as passenger revenues were concerned.

In the field of international commercial air transportation much important pioneering work had been accomplished. In the light of events since the outbreak of war, however, it would appear that a combination of political and technical developments was to take place which would open the eyes of the world more completely to the true possibilities and capabilities of aircraft as a link between continents and nations not otherwise sufficiently connected to create the feeling of a community of interest.

In the pre-war period, while technical advances were laboriously being proven in the conservative manner of private enterprise (with its own capital and reputation at stake in spite of any aid that may have been contributed by a governmental agency) the diplomacy and relationships between nations leading to the establishment of international airlines was following an uncertain and tortuous path. Each port of call along a given route generally came into being as a result of private "negotiations" and "arrangements", and underlying all international air activities was a sort of superstitious distrust of the mysterious new medium. Indeed, it may be that the storm of war that actually broke

from the skies has crystallized in many minds a complete distrust of the air as a medium of international transportation.

Military Airpower

Airpower as a means of conquest was most fully comprehended and developed by the Germans. It was only by repeated shocking, and under the stress of actual severe blows, that the Allied Nations were aroused from the somnolent lethargy into which they had permitted themselves to sink. Insofar as airpower as a means of conquest is concerned, history appears to have been made by the fact that Hitler chose to strike when the development of airpower as a striking force was perhaps as little as one year short of that development which would otherwise have engulfed the British Isles. The outstanding conscious development within the Allied Nations toward the recognition of the military potential of airpower was the establishment of the Royal Air Force as a separate branch of the military services. This came about as a result of lessons learned in the First World War. During the intervening period, history was to prove that but one effective weapon lay between a precarious survival and defeat. The fighter plane—the justly famous Hurricanes and Spitfires—came to England's and the world's rescue in the most fabulous last ditch stand that history has yet recorded.

So far from any sense of reality of the impending danger was the United States that today, with the products of the largest single industry ever to exist at its disposal, the Army Air Force is still a subordinate command. Well aware of this condition, the government now debates the wisdom of such a move only because of the exigency of the situation.

The most significant contribution of the United States to military aviation that was developed in the years prior to the War and that has been of vital importance in the adjustment to war conditions came from the manufacturing industry. This contribution has been the tremendous extra margin of performance, or "safety factor" built into all the major components of the basic aircraft structures. The United States aircraft manufacturing industry was the outcome of a fortunate combination of factors. Born in the boom times of the late 'twenties, most of the major companies were financed by the sale of common stock. With little or no fixed obligations appearing in their capital structures they were well prepared to weather the financial storms of the 'thirties. During this period of depression there was offered to them an abundance of young, well educated personnel, and tremendous

technical strides resulted. Even so, the airplane had not, prior to the present war, reached the point where the small low-priced product promised to be much of a success.

With economy the order of the day, the industry, under the regime of highly competitive capitalistic private enterprise, seized avidly upon any morsel of business, seeking always to make each product better than the latest best in the field. So precarious was the business that a good name could be lost through a single accident having even a suspicion of structural failure as a cause. The contracts to be had were financed by a somewhat reluctant Congress, by a small but sturdy airline transportation group that could be supplied by one manufacturer alone, and by foreign governments purchasing military types. The bulk of this business favoured the manufacturers of the larger airframes and higher horsepower engine units. Dubbed by "Time" magazine as the "Threadbare Thirties", that decade produced a lean but sturdy boy of an industry capable of handling the man-sized job to come. To gather some idea of just how lean times had been for this industry, it should be borne in mind that air transport in the United States in 1939 was performed with the services of 265 aircraft. To understand how well the manufacturers had built, these 265 aircraft were shortly to complete a full twelve months without a fatal accident during which had been flown more than 87,000,000 airplane miles.

To gather the real significance of conditions in the United States two years before Pearl Harbour, it is necessary to call the roll of aircraft types that were flying at the close of 1939. A Catalina had been flight delivered to England from Newfoundland. Lockheed Hudsons were coming into full production. The Douglas DB-7 Bomber, delivered to the French in quantity before the outbreak of the war, was later to be named the "Boston" and to gain fame over the African desert and indeed against the French mainland from bases in England. The Bell Airacobra and Consolidated Liberator were shown minus war paint. North American B-25 bombers, later to have the class name of "Mitchell" and to win fame as the first to bomb Tokyo, were in production. The Curtiss P-40 and the Martin "Baltimore" were in quantity production. The Boeing Flying Fortress had undergone the first of many "face-lifting" processes. The P-38, sans war paint, was not yet named "Lightning." Consolidated's PB-Y went into Navy service that year. In the transport class, there were the Boeing "Stratoliner" and 42-ton Pan-American Airways "Clippers". The DC-3, by Douglas, was on the threshold of the hall of fame, and forty DC-4 aircraft were ordered by major airlines after successful demonstration of the proto-

type. The Curtiss "Commando" was not yet named, but nonetheless present.

We may thus picture the situation in the United States during the closing months of 1939 about as follows. In flight were all the types of aircraft with one or two exceptions that were to represent the contribution of United States airpower toward definitely blasting Axis hopes of victory. While representatives of Great Britain, France, and Holland worked night and day to place further orders and to hasten the delivery of the several models already in quantity production, agents of Germany, Japan, and Italy were free to look on, to watch all these aircraft in flight, and to obtain most of the basic statistics by the ordinary procedure of buying a copy of the Aircraft Yearbook published by the Aeronautical Chamber of Commerce of America, Inc. To understand why the Axis continued to move with such assurance, and to explain why these aircraft could not make their weight felt on the fighting fronts until 1943 is to explain the difference between airpower as a tool of peace and prosperity and airpower as a weapon of warfare.

Three Comparisons of Civil and Military Airpower

In order to simplify a picturization of the difference between these two types of airpower, it is convenient to compare them in three ways: (1) Basic design differences; (2) Secondary or accessory design differences; (3) Operational organization differences. During the closing years of the First World War a considerable specialization of aircraft took place, but because the basic aerodynamic advances were forthcoming in a constant flow, and because the Allied Nations in general gain little satisfaction from developing a new science merely for the purposes of war, any divergence in the paths of the two airpowers was not great during the decade of the 'twenties. That the divergence had become so unexpectedly great in the decade of the 'thirties was the near fatal mistake we had made and that was so clearly comprehended by the Axis.

In developing airpower for trade and commerce, it is assumed that the objective is to give the most air transportation of passengers, mail and freight, for the cheapest cost. In developing airpower for warfare, it is assumed that the principal objective is to strike at the zone of the interior of the enemy in sufficient power to cripple the enemy's centres of production, and to afford the striking force the maximum protection possible consistent with a reasonable opportunity to carry out the mission.

Basic Design Differences

Under basic design differences, there can be considered the items of speed, range, ceiling, type of cargo, safety factor, cost.

Speed is frequently considered as the essential service that commercial air transportation has to offer. However, current studies on the subject indicate that beyond certain optimum speed ranges additional increments of speed become uneconomical and ultimately prohibitive. There is much to indicate that commercial air transport of all types, both now and in the foreseeable future, will operate somewhere in the range between 125 and 250 miles per hour. From the viewpoint of military airpower, interceptor types must develop speed at any cost but that of firepower. Since a stern chase is a long one, bomber command will want aircraft approaching the speed of interceptor aircraft if at all possible, reducing the exposure of the air force to enemy firepower to the least amount of time possible. Today there exists no essential difference in speed between commercial transport aircraft and heavy bomber types. It is believed, however, that commercial operators will be content with the speed they now have, while the military will continue to press for higher speeds.

Range to the commercial operator is somewhat the antithesis of profits. For a given size of aircraft, any range beyond a given basic range is obtained generally at the cost of less revenue load carried. Thus, the rate charged, or the profit made, will ultimately depend upon the range between refueling points. To the Air Force Commander, range is fixed by the distance from his nearest suitable air base to the objective in enemy territory. Until our aircraft have sufficient range to cover all points in Germany and Japan there will be considerable pressure upon designers to produce aircraft with such performance.

Certain lessor range factors can be pointed to in both the commercial and military cases. Thus, an operator of commercial aircraft making four refueling stops at bases in the course of an ocean or desert crossing, with no addition or subtraction to the revenue load, must take into account the cost of the bases, the cost of additional ground personnel, and equipment, the loss of earning power of the aircraft due to its being on the ground one to two hours longer each day, additional stocks of spare parts to be carried at the refueling bases, delays owing to poor landing conditions at refueling bases, additional flying time costs of crews and aircraft because of time lost in leaving cruising altitude and manoeuvring for landing and take-off, extra risk induced by extra landings, losses caused by congestion caused by other aircraft, and losses as a result of lowered prestige and efficiency in comparison with other carriers rendering express service. The military commander must establish the limit to which he can carry a sufficient weight of

bombs to make the probable damage to enemy installations worth the probable loss of aircraft.

The military commander who can operate above the effective *ceiling* of enemy defenses could afford to give up much in the way of speed, defensive armour and firepower, and would expect to operate with very few losses. There is therefore no apparent limit to the desired operational altitude of some types of military aircraft. Commercial air transportation, on the other hand, has no very well established reason for desiring to operate continuously above 20,000 feet and may very well be content to operate below 10,000 feet in vast areas of the world.

The specific gravity of military *cargo* is much greater than that of commercial cargo consisting of mail, passengers, and express. This results in a fuselage design which, if adapted specifically for one purpose, will prove inefficient or unsuitable for the other. Proper designing of bomber aircraft will generally result in a comparatively small fuselage cross-section. This in turn will add to the speed, altitude, and range of the aircraft. Present designs of commercial aircraft have tended to indicate that considerable increase in fuselage size and passenger accommodations will be desirable in newer types to come. This item is one of the most basic differences in design factors.

Old conceptions of *safety factors* may come in for considerable revision after the war. The highly conservative margins of performance and design strength were applied to military and commercial aircraft alike before the war. As previously indicated, this was the factor that enabled the Allied Air Forces to adapt their aircraft to the changes that became so clearly necessary under actual combat conditions. The process consisted simply of fitting the modifications necessary, and putting aboard the fuel necessary to complete any desired mission and the cargo that had to be carried. If the airplane continued to fly in a reasonably satisfactory manner, nothing further was asked of it. Invariably the aircraft came through in good shape. It is likely that military commanders in the future will return in some measure to the old conservative load limits and operating methods, but the use of "overloads" has been too great a factor in present military operations to be ignored in future textbooks.

In essence, commercial operations have been, and will continue to be, guided by the premise of having sufficient reserve of power and strength to get through under any foreseeable circumstance. Military operations are presently based upon a sufficient margin to complete

the mission under normal circumstances. The result is generally from 10% to 20% increase in military gross weight over commercial or civil gross weight, for identical aircraft.

The *cost* of a commercial service ultimately determines the extent to which people are able to use it. Under capitalistic private enterprise an increased demand will normally result in an increased service, and control of the basic need for the service rests directly with the consuming public. The cost to the public is the rate charged less taxes paid by the carrier. Any type of commercial enterprise will usually profit by the purchase of more expensive aircraft giving more efficient service. So far as military aircraft are concerned, the peacetime purchase of a few units involving the development of prototypes is bound to be a highly expensive undertaking. The actual dollar value of military aircraft in quantity production in time of war may be lowered as a result of the high output. In the final analysis, there is no satisfactory basis for comparing the costs of military and commercial types.

Summarizing considerations of basic design differences, it can be said with assurance that the type of cargo accommodations required by the military will be highly unsuited to commercial transportation needs, and that the military will in all probability press for more performance in speed, ceiling and range over and above that which the commercial organizations will care to pay for. Moreover, the military will not hesitate to reduce their margin of safety whenever necessary, while the commercial aircraft will continue to conform to a well defined practice in this respect.

Secondary Design Differences

The secondary or accessory design differences may be discussed principally under the headings of cargo accommodations, crew accommodations, communications equipment, defensive armament and firepower, and ground accessories. The military type must be capable of operating at times in somewhat poorly prepared circumstances. The commercial type can expect to take advantage of the highest degree of preparation adding to the safety, efficiency and comfort of the operation.

Cargo accommodations resolve into considerations of mechanical adequacy in the case of military operational aircraft. A reasonable flexibility as to size and numbers of bombs that can be carried, safe handling devices for loading and unloading the bombs, adequate means of aiming and dropping bombs in flight, and access to the bomb compartment in flight constitute the type of problem arising in the case of the military bombing aircraft. The technical complications of the bomb aiming and dropping device are a major consideration and the

structural design of the aircraft must be capable of supporting highly concentrated loads.

In the case of commercial types of aircraft, every consideration will be given to promoting passenger comfort and convenience. Mail and freight must be carried to destination in exactly the same condition in which the customer delivered these to the carrier. This will call for heated compartments for certain types of freight, and possibly pressurized compartments for freight that would be damaged by being subjected to reduced atmospheric pressure at higher altitudes.

In the case of passengers, the airlines have a very considerable goal before them if they are to attain the comfort and convenience levels afforded by railway and steamship accommodations. It will be very nearly impossible to give air passengers the cubic footage of space allowed them in present-day types of railway coaches. Every effort will be made to eliminate the noise and vibration, to furnish the most perfect air-conditioning possible and to pressurize passenger cabins in the case of high altitude flight. The aircraft is inherently capable of giving a cleaner and smoother ride than is the railway or steamship when conditions are most favourable. When it is necessary to conduct flight in rough air, it is likely that passengers will continue to find such flying somewhat objectionable in future types of aircraft, although possibly not as much so as in the smaller types of the past. The furnishing of passenger accommodations will be a costly business to the air operator and in some types of services the weight of such passenger accommodation will equal or exceed the weight of the passengers carried.

Here, in a consideration of cargo accommodation, we find a major difference between military and commercial aircraft.

Crew accommodation and stations on military aircraft will be disposed at many points about the fuselage and perhaps about the wing structure. This will be guided by the necessity for having clear vision and firepower at all angles from the aircraft. Military crews, up until the present time, have been expected to act as self-sufficient individuals. In other words, each man is heated by his own flying suit, controls his own oxygen supply to a large extent and communicates with the balance of the crew by use of an interphone system. Each station is designed with a view to affording the crew member some emergency means of exit and the wearing of parachutes is still very much in order.

In commercial aircraft, crew accommodations will probably be confined largely to the operation of the aircraft from the flight deck

and such comfort provisions as may be desired for longer flights to accommodate relief crews will probably be built immediately adjacent to the flight deck. Except for a moderate amount of steward service, air passengers can expect to see less and less of the flight personnel. Crews of commercial aircraft may possibly be heated and quartered in somewhat similar circumstances as military crews with regard to high altitude, long-distance aircraft of the immediate future, but this, if so, will undoubtedly be but a passing stage. Eventually all commercial aircraft crews can expect to be fed and accommodated in a manner similar to that of the passengers.

The question of crew accommodation is, therefore, an important item of difference between military and commercial aircraft.

Communications equipment furnished in military aircraft has, until the present time, been highly flexible in nature. An abundance of communications receiving and transmitting channels are afforded military aircraft in order to provide for any changing circumstances of warfare. In addition, much highly specialized military equipment for the detection of the enemy and for effecting safe landings has been developed in the past few years. An integral part of this communications system is the extensive interphone installation required for communication from one station to another within the aircraft.

Commercial aircraft will require communications equipment of the highest possible quality and while it will duplicate the military requirements with regard to some items, it will, in general, be more specialized as to the number and types of transmitting channels. There will likely be a considerably less costly installation which will also afford some saving in weight.

This item is a secondary but important difference between military and commercial aircraft.

Defensive armament and firepower are non-existent on commercial types of aircraft since both items are made of extremely heavy material which greatly reduces the pay load. The developments that took place on the types of aircraft we have previously described in the several years between their prototype production and their actual appearance in numbers on the war fronts consisted largely of improvements to the protective armament and increase in firepower. The matter of furnishing fuel tank cells with bullet-proofing material in some cases reduced the possible fuel load by 25% and at the same time added to the total load. The armourplate furnished individual members of the crew for protection at vital spots might, in some cases, more than equal the

weight of the crew. It was also found advisable to protect vulnerable engine components. The installation of modern power-controlled gun turrets called for permanent alterations to the basic structure of the aircraft and each such unit cost many hundreds of pounds in extra weight added to the aircraft. There is every likelihood that armour and firepower will continue as a greatly diverging development between military and commercial aircraft.

Ground accessories depend, in most part, upon the type of cargo handled, and in other ways reflect the organizational differences between that required to conduct a military operation and that required for commercial operations. Ground accessories of the military organization tend to run to many pieces of large, expensive mechanized equipment for the rapid preparation of runways and ground installations for the refueling of heavy aircraft in larger numbers than in commercial operations, devices for the salvaging and servicing of aircraft in extreme climatic conditions, and mobile machine shops. Ground accessories for the military are, of course, adapted to handling military cargo, bombs, ammunition and, in general, must be mobile in nature in order to keep up with the changing conditions of warfare. The need for mobile equipment, however, does not eliminate the need for heavy fixed base installation.

Ground accessories and installations for the commercial organization can take the advantage of long-range planning to a fixed operation. The first consideration is usually the comfort and convenience of handling passengers boarding and leaving aircraft. Growing consideration will be given to the problem of handling heavy cargoes of mail and freight as cheaply and as rapidly as possible. Servicing facilities tend to be permanent installations where many aircraft can be brought to a single base for repeated use of the same servicing equipment.

The differences in ground accessories and installations of military and commercial operations will be great.

Operational Organization Differences

There are many deep-rooted differences between the organization required to operate military aircraft and that required to operate commercial aircraft. Although a discussion of either type of organization is a subject requiring textbook treatment, we might here point out a few of the major items at variance. These can be discussed under the headings of basic mission, organizational specialization, lines of communication and physical size.

The *basic mission* of the military organization which has been

previously referred to is to destroy the production centres of the enemy. The commercial organization attempts to furnish the greatest amount of safe and reliable air transportation possible at the highest speed, consistent with a reasonable expenditure of labour and materials. The comparison of these two missions indicates a basic difference in philosophy that will be reflected in numerous physical and practical ways.

The commercial operator will be limited to a far greater *specialization of organization* than will the military air force. Under war conditions the military must provide for as many contingencies as possible and any unit in the chain of command must be capable of furnishing the necessities of life as well as the means of accomplishing the military mission. Men must be fed, clothed, housed, furnished medical treatment and given a comparatively high level of physical comfort and convenience in order to establish a smooth running military air machine.

The commercial operator has in some instances been forced to furnish similar basic necessities of life but under such conditions the air operation will usually be classed as in the pioneering stage. The flow of traffic is believed by some to be dependent upon the size of population served and in general the greater the population the more completely specialized the airline operation will be.

That is to say, the airline operator will generally make use of the specialized services of other commercial enterprises that will furnish equipment, supplies, necessities of life and the usual services that are abundantly offered in the course of daily civilian routine. This will allow the operator to concentrate upon his basic mission of furnishing air transportation with the highest degree of safety, comfort and efficiency.

The broad staff divisions of a military organization are generally considered under the headings of personnel, intelligence, operations and supply. The essential staff divisions of a commercial organization can be designated as operations, traffic, accountancy and personnel.

Lines of Communication are equally important to the military organization and to the commercial organization. The military organization will usually take steps to establish and safeguard its lines of communication and will not be content to depend upon outside agencies. Consequently, the military organization will generally be burdened with a heavier communication problem than will the commercial organization.

Commercial transport organizations will frequently find it necessary to establish their own lines of communication in order to afford instantaneous contact and control of aircraft in flight at all times. However, routine communications for the distribution of information and supplies will generally flow through the ordinary civilian channels of radio, wire, airline and surface transport.

The growing airpower of the Allied Nations indicates that the *physical size* of military airpower will far exceed that which commercial air transportation might hope to attain in the foreseeable future. Air lines will attain stature as major transportation organizations only when they are capable of transporting freight in large quantity. This is generally considered to be dependent upon operating at rates far lower than can now be conceived. The limit of conventional airline growth might be pictured by stating that 700 one hundred passenger trans-oceanic aircraft could transport the population of Canada to England and back again once each year.

Conclusion

In a time when decisions of major importance to the future development of airpower as a means for furthering peacetime aims are being taken, it is to be hoped that the severe impressions resulting from the surprising power and effectiveness of the Axis' use of airpower for conquest will not distort these decisions. One no longer feels that any merchant marine vessel sailing the seas is a menace simply because some other ships are warships. It is no more logical to fear the passage of a commercial airliner than it is to fear that a merchant marine ship will pull into dock and commence shelling the city hall with a hidden piece of armament. From the present time onward, commercial airpower will have diverged so completely in practically all phases of design development and organizational employment that it should no longer be possible for any nation in the future to go undetected for the five or ten-year period necessary to build an air weapon capable of striking in the manner that Germany and Japan have struck the Allied Nations. The burden now resting with our Governments is that they guarantee us the full use and development of airpower as a tool of peaceful promotion of trade, commerce and, above all, for the promotion of intimate confidence and understanding between nations. Herein lies the true protection of one civilization from another—a possible means of guaranteeing those nations intent upon having peace that they will not forever have to devise weapons of war from every new art or science the future brings forth.

IS THE WEST READY FOR TOMORROW?*

A. N. MITCHELL

President of the Canada Life Assurance Company

WHAT is the situation to be after this war is over?

Is there any other country in the world that has greater probability of successful living conditions than Canada? Our meagre population of eleven and a half millions even if doubled would not be reaching the bounds of our ability to produce food, clothing and shelter. But what a difference such a change in population would make to our debt-carrying ability! I am convinced that the very advantages this country offers are bound to attract to it after this war an influx of new population. The number of immigrants available for us is almost sure to increase. The end of the war and the end of totalitarianism will no doubt see a removal of the ban on immigration which for years has been imposed on the nations of several European countries, and make available a tremendous number of would-be citizens of Canada. Everything points to ample immigration offering. It will be for us to select the quality we need. All we require to take care of that flow of people is abundance of food, plenty of clothing and ample shelter and some margin of production to exchange for luxuries we cannot produce at home. We have capacity to produce all these essentials in such quantities as no other nation in the world has in proportion to population.

Our wealth has only been scratched.

If this applies to all Canada—and it does—how much more true is it of the almost untouched resources of Western Canada, especially when we keep in mind the expanded horizons brought by the tremendous advances made in these war years in mastering the air.

If we wish to induce this influx of population, what must we guarantee? Employment surely, in the broadest sense of the word, is our answer. What is needed to provide that guarantee? The obvious answer is either ready cash, that has been saved for the purpose, or soundly based credit. Large expansion cannot take place without one or the other.

Where credit provides the means it must come from the savings of individuals usually found in bank deposits, trust funds, life insurance premiums or from taxes.

*Text of a speech delivered at the Canadian Club, Winnipeg.

The cash or credit needed to finance development cannot, however, be had from these sources unless certain elementary requirements have been met. This point is basic. It is not confined to the West, to the East, or the Pacific Coast. It is universal in its application. It is just the same if I wish to borrow \$100.00 from Bill Jones, or \$1,000.00 from my bank, or \$5,000.00 from a life insurance or mortgage company to build a house, or buy a farm, or \$50,000.00 from the general public through a bond issue to finance some enlargement of a company's business. The possibility of being able to secure the needed money in each instance is governed by almost identical requirements. They apply equally to the individual or the corporation. These requirements may be had by answering one short question: What are the chances of recovering the money loaned and of obtaining a reasonable rental for the money while it is in service?

Investment dollars will gravitate to the place where they can be assured of adequate security plus a fair return.

The probability is great that most of you own one or more life insurance policies. You arranged for these contracts because you had various personal needs for which you wished to provide. In acquiring these contracts you were restraining your own selfish interests and foregoing personal expenditures. You did it to build up a fund through the medium of insurance either to take care of your own old age or to take care after your death of some one you loved; or possibly you were setting up the fund to provide against certain possibilities of future needs in your business.

No matter what the cause, you were foregoing certain immediate personal satisfactions to take care of some future need. It is safe to say that you chose that method because you were convinced that it was a safe way to build the necessary funds for the future.

There is no magic in the way life insurance funds accumulate. These companies are merely co-operative groups of citizens who place their hard-earned dollars in the keeping of a group of officials whom they expect to do a variety of things with the funds provided. It is the duty of these officials to see that the contracts between the company and its policyholders or, in other words, between an individual policyholder and the remainder of the co-operative group, are fairly and justly administered.

The individual policyholder, in making his contract, secures the right to make several claims on the general funds of the co-operative

group. He provides that a certain sum shall be paid to certain people after his death, or that certain sums shall be payable to him at a certain time during his life. He also provides that he may cease the contract under certain conditions and have a right to claim certain monies, or he may under certain conditions borrow up to a fixed amount from the co-operative fund accumulated.

It is the duty of the officials administering the fund to see that all his just claims, no matter what the cause, are promptly and completely met. It is their duty also to see that no one policyholder gets an unfair advantage over his fellows. It is their duty to see that the expenses of the necessary operations are kept at the lowest possible point commensurate with efficiency. Last, but certainly not least, it is their duty to invest those portions of the premiums paid by the policyholder and not immediately used to pay his just claims in such a way that funds will be available at any time even in a somewhat distant future to properly and completely care for the great mass of future claims which the policyholders and their beneficiaries will have against the co-operative fund so built up.

The experience of the past has taught that the amount of contribution which should be made by each policyholder, or co-operative member, in order to bring about the results desired, can be accurately calculated if a rate of interest to be earned in the future can be and is assumed. It is the duty of these officials acting on behalf of the co-operative group to see that the fund so accumulated is invested in such a way that it will earn this minimum rate of interest. These officers are, therefore, in reality quasi-trustees on behalf of the co-operating policyholders. Their actions must be guided, therefore, purely by the interests of these real owners of the funds accumulated. The care with which these operations must be pursued will be understood when we stop for a moment to realize the effect there would be on you and the country at large if carelessness in any way endangered these funds upon which you expect to call for future needs.

Almost every citizen of Canada is today either a policyholder or a beneficiary of a policy. Almost the whole nation, therefore, has a certain large proportion of its future security dependent upon the careful thought of these officials who act on their behalf. Because of the purpose of these accumulations, so safeguarded, they are without doubt in the minds of most people the most important savings which they have ever made. They result almost invariably from real self-sacrifice and for this reason take on a particular importance in the eyes of the savers.

The group with whom I am associated, as well as other such groups, believed that the inhabitants of the West were strongly imbued with this sound attitude of mind toward debt, and for many years invested large amounts of money in these Provinces. It was not money belonging to ourselves or to any wealthy man or men who backed us. It was money belonging to you and your friends and men like you all over the country. In fact, all the funds accumulated by our policyholders of these Provinces were invested here and certain funds belonging to policyholders elsewhere. A large proportion of these investments so far as these Provinces were concerned consisted of mortgages on farms. It would be well to bear in mind at this point that you policyholders provided the money for these mortgages. Moreover, it took, on the average, four or more policyholders to provide the money for one mortgage.

The reason for such investment was a firm belief in the great future of these Western Provinces and the belief that the sound human stock which had migrated here would do its utmost to repay the monies loaned them for developing their land and Province.

During the first couple of decades of these transactions everything went favourably. The confidence of those who had invested your money in the Prairie Provinces was justified. Then came a period of distress from natural causes—natural causes, however, which nobody had foreseen. The severity of the drought these Provinces suffered in the '30's may have had its similar counterparts in times past, but certainly none like it had occurred at any time since the settlement had been sufficient to record events.

Today, however, nature is smiling again. There is every evidence throughout the West of a rapidly growing prosperity. There is every reason today for a confirmed belief in the possibilities of this country.

During the period from 1938 to 1942 individual debts have been greatly lessened.

An excellent evidence of the return of prosperity is found also in farm sales. They are being made more freely than in past years. The Company I represent has this year, for instance, sold a number of farms in the Province of Saskatchewan and received cash payments amounting to nearly 40 per cent. of the selling price. The fact that a considerable number of these sales have been made to former tenants and to men who have farmed in the same district in which they were buying is, in my opinion, a good indication that efficient farmers have

not only been able to make a good living but that they have also been able to accumulate money to establish themselves as owner occupants or to increase their land holdings. This is but a sample of the experience of all those who have been lending to Western farmers. These sales, moreover, have not been limited to any one district. They are common to all districts. The West is today again coming into its own and on a much sounder basis than it has ever been before.

We are convinced that despite the hardships of the '30's, it could be still good judgment to help, by investment, the farming development of Western Canada, provided—and here comes the difficulty—provided the West can return to the same frame of mind about honest debts that was found here in the earlier days.

During the early decades when diversification in farming was almost unknown in many districts, it was most natural to gradually associate the ability to pay farm debts with the grain production possibilities. In the early years of the '30's when nature seemed to destroy the grain production, it was accordingly quite natural that there should develop a feeling of impossible debt.

The present diversification is proving, however, that grain is not the only measuring stick. Bank of Canada statistics show, for instance, that in the Province of Saskatchewan in the year 1936 grain produced a cash income of over 93 million dollars, while livestock and dairy products produced only 31 million dollars, a total of 124 million dollars. In 1942 the cash grain income, apart from subsidies, had increased about 18%, but the income from other sources had increased by about 150%.

Manitoba had already a greater proportionate diversification in 1936. Yet the change here from 1936 to 1942 was almost as astounding. Manitoba, by the same authority, increased its cash income from grain, apart from subsidies during that period, over 60%, but the cash income from other farm products was almost trebled. The result was that the total had more than doubled and the income from products other than grain now considerably surpassed the income from grain. Alberta had a similar remarkable change. Grain cash income was only slightly more in 1942 than in 1936, but the income from other farm sources almost trebled and the total farm income accordingly almost doubled. Grain is no longer the measuring stick of farm efficiency in the West.

One of the most encouraging factors in the picture of the '30's was that such a large proportion of those who had borrowed the money of our policyholders made such a magnificent struggle to finance their

debts. We have met constantly a reasonable attitude on the part of the majority of borrowers. As lenders of your money, we recognized that it was good practice and sound business on your behalf to encourage such borrowers during these difficult years and to make such compromises as would maintain an attitude of mind which would endeavour to repay the debt so far as humanly possible. We are glad to say the majority of borrowers met us co-operatively in discussing their situations and showed a desire to do their best to meet their obligations.

The legislation of the period seems to have been aimed to satisfy the demands of a comparatively small percentage of borrowers. The great majority did not attempt to take advantage of it. It would seem evident that the time has arrived when all this type of legislation should be reconsidered. Surely it is pure defeatism to carry forward such legislation into times of well-being!

May I make a suggestion for the future? Agriculture is a basic industry of this country, and as such needs the most sympathetic consideration from legislation. In recent years legislation has been attempting to give that support when difficulties arose by debt reduction. Should it not have aimed instead at supporting income for the deserving farmer in times of trouble? Should one group of citizens be compelled by legislation to make good the hardships of another group? Should not the country as a whole share the burden of a basic industrial group when Providence imposes disastrous situations on that group?

What is the situation coming after this war? What is needed most of all when it comes to reconstruction? Surely it is employment and the broadest possible employment. Thousands of men will be returning from the Navy, Army and Air Force and from the munition works seeking a new employment. We of this country should be devoting every thought we can to devising the best possible means we can to provide this employment. This development of employment requires agricultural as well as industrial expansion. As said before, expansion to the extent which appears to be needed is not possible without that credit which is based on a sound belief in the reliability of borrowers.

One of the features of certain debt legislation which constantly astounds is the lack of realization of its effect on those who have no debts. There can be no doubt that the man who owns unencumbered property is very hard hit by the destruction of credit which the typical debt legislation of the last few years brings about. We see about us in the West, in all parts, men who have acquired property and wish

to dispose of it. If no mortgage has already been arranged on the property, they find themselves in the dilemma of having to demand a very large cash payment if the sale is to be safe. The necessity of large cash payments in connection with sales must, of necessity, keep prices down. The values of property are very materially depressed by anything which interferes with credit. Throughout the West there are people who would like to turn their property into cash but are unable to do so at any satisfactory price because of fear that the mortgage required to secure a proper price may be interfered with by law. Hence comes the consequent necessity of large cash payments if sales are to be effected.

There are many who seem to think that these laws affecting debts are merely aimed at lending corporations. Some people think of them as a rifle shot straight at a particular spot. Instead of that, they are blunderbusses scattering the shot in every direction—taking a crack at everybody in the district.

You, in this Province, in your provincial financing, have been setting a fine example. It is a leadership for western provinces of which you may well be proud. Saskatchewan has been also doing well with its provincial financing. Legislation destructive to individual credit, however, is still in force in Saskatchewan and Alberta and recently all the prairie governments have joined in asking the extension of Federal legislation which, if continued in the form it has had, is not conducive to renewed confidence in agricultural credit.

Credit expansion cannot be expected in the post-war days while legislation ignoring the creditors' rights is promulgated. Capital—your capital, remember—your accumulated funds—must seek safety. Those parts of Canada which encourage proper debt repayment must of necessity furnish the fields in which the expansion requiring credit will flourish.

It is time to consider the ultimate effects rather than the immediate effect of legislation benefiting debtors to the disadvantage of creditors. There is a tendency to think of creditors as cruel persecutors of the debtors. As a matter of fact, speaking for institutional creditors, I can assure you from long experience that ownership is the last thing they want. They will go to almost any lengths to avoid it. But acting as trustees for you, they, of course, desire the repayment of loans made. Foreclosure and suit, however, are a last resort. If credit, however, is not to be destroyed or at least severely impaired, there must be in cases of default, when all other means fail, a well established and

positive method of getting possession of the security which was offered by the borrower when he sought the loan. If this method of realization of security is tied up to unusual difficulties, credit must naturally go elsewhere, no matter how great the need of the borrower.

Summarizing, let me say first that for my own Company (and I believe the chief officers of every similar institution in Canada, including the fine sound group whose chief offices are in this city, would say the same) there is no East, and there is no West. There is only one country and that is Canada. We all have every reason to wish to see all sections of the country flourish. Secondly, we believe that the decade following the war will be years of golden opportunity for this country as a whole and should be for Western Canada in particular if it is ready to take advantage of its favourable conditions. It would seem to me, speaking as a friend and believer in the possibilities of this section of Canada and as a believer in the grand basic qualities of the people who inhabit it, that a start cannot be made too soon towards re-establishing a sound individual credit position. It is so easy to sell one's birthright for a mess of pottage. The birthright of the West is so magnificent! What a tragedy if this opportunity for its development is lost. Lastly, surely it is apparent that under present-day earning conditions here in these provinces there can be no reason why any credit disturbance should be allowed to continue.

The West, like all Canada, is the land of opportunity. All it needs is courage and honesty of purpose for the development of these opportunities. Every opportunity, however, is hedged with difficulties. Our greatness will be measured by the courage of our people in meeting those difficulties which always beset opportunity.

CANADA BUILDS THE MOSQUITO

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THE present war has produced no more spectacular weapon than the de Havilland Mosquito. This versatile instrument is employed as a day and night fighter, bomber and intruder, and is the fastest warplane in operation in the world. The need for a plane which could outfly all others was foreseen in England, and the engineers of the de Havilland Aircraft Co. Ltd. set to work on the task of designing and building such a one after the beginning of the war. Within eleven months from the time when the drawings were made, the first prototype was flying and within only twenty-two months the machines were in combat. Today they are still unrivalled by the best that the enemy can produce.

The design of the Mosquito was brought to Canada for manufacture by the de Havilland Aircraft of Canada Ltd., in Toronto. Its production is now included in the material contribution of this country to the war effort.

Although the maximum speed is a secret, foreign sources estimate it to be 430 miles per hour. To the most hardened speed demon, the sight of this plane performing acrobatics is breath taking. As it goes through the manoeuvres, silver ribbons several feet long are seen streaming from each wing tip. Present theory suggests that, when travelling at such terrific speeds and at a high angle of attack, the wing tips stir up the air and the resulting compression and expansion produces ribbons of condensed water vapour which seem to peel off the wing tips.

This mid-wing twin-engine monoplane is powered with two Packard-built Rolls-Royce Merlin engines. Each of these develops over 1,000 horsepower and turns a three-blade hydromatic propeller. The aircraft has an over-all wing span of approximately 54 feet, an over-all length of 41 feet and a maximum height of the airscrew tip is 15 feet on the ground. The two under-carriage units supporting the landing wheels are retractable in flight to a position under each engine nacelle. The tail wheel is partially retractable.

The minimum of armour plate is employed in order to save weight



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and the pilot relies on the enormous speed and agility for his protection. The basic fighter is equipped with four 20 mm. cannons and four .303 machine guns mounted in the nose. It is as manoeuvrable as single-engined fighters such as the Spitfire, and can circle inside the best German models. The most complicated manoeuvre can be carried out with one engine shut off, and with both motors pulling, it is more than a match for the best planes that the enemy can send up.

The bomber carries a load of 2,000 lbs. and makes trips of 1,200 miles to drop its explosives on enemy targets. The planes sweep over hostile territory at a height of 15 to 50 feet above the ground, which is well below the effective range of anti-aircraft guns. They follow a charted zigzagging course, taking advantage of the topography of the country to give them an unpredictable flight skirting a row of trees, ducking around a hill and swooping through a valley, allowing the machine-gunner on the ground no time for preparation.

At close range the bombs are placed squarely on the key targets and the planes have flitted away before any retaliation is possible. The bombs are necessarily of a delayed-action type to allow the pilot time to escape his own destruction.

Although the amount of damage that can be incurred by this type of raid is smaller than that by mass raids, the efficiency is very much higher. When a power station, bridge, gasoline depot or other vital target might escape the effect of a mass attack, it is an easy mark for the Mosquito. A favourite task is "shooting-up" the trains of the already overburdened transportation system on the continent.

The Mosquito was the natural plane to choose for some of the more spectacular daylight raids on Nazi headquarters. The first of these occurred in September 1942, when a flight of four attacked the German Gestapo buildings in the centre of Oslo. Cameras confirmed the accuracy of the raid and actually recorded the landing of the bombs on the targets. Enemy planes rose in a futile attempt to intercept the bold intruders.

It was no coincidence that the impudent marauders arrived over the Berlin Air Ministry Building as Göring was scheduled to speak on the radio. The broadcast was cancelled and the only sounds which emanated were those of bombs crashing, giving great delight to those "listening-in" in England.

Many factories in the occupied countries such as France, Holland, Denmark, etc., are supplying war and essential materials to the Reich.

It is just as important that the production of these plants be curtailed as the destruction of those within enemy boundaries. With greater accuracy than dive bombers, the Mosquitos put them out of commission without incurring the wrath of the people by killing a large number of civilians.

Great care is taken in the selection of men with physical and mental qualifications to fly the Mosquito. To manoeuvre it at terrific speeds, great daring and perfect judgment are required. A machine moving at 400 miles per hour travels 15 feet in less than three hundredths of a second, so that hedge-hopping is a feat of which the average person is not capable. The pilot and observer are seated side by side and either one must be able to perform the duties of the other. As well as flying, this includes navigation, gunnery, wireless operation, bomb aiming, photographing, etc.

There has been much speculation regarding the effect of the war-time development of such materials as plastics, plywood, light metals, electronics, etc., on peacetime products. The Mosquito is made almost entirely of the first two of these materials. Modern developments were used to laminate veneers to give a resulting plywood with a strength to weight ratio greater than that of most metals and also the necessary waterproofing qualities. By using this material, a saving was made of essential metals, and new labour groups and skills were utilized. The construction eliminated the need of riveting, thereby saving labour and reducing the drag on the plane.

It was necessary to work out entirely new methods of construction which are quite interesting. The fuselage is built on concrete forms in two longitudinal sections and is made up of two layers of plywood separated by a layer of balsa. These laminations are bonded by casein glue and broad steel pressure bands are tightened over the form until the glue has set. The use of split construction of the fuselage permits the assembly of a large proportion of the internal equipment before the two halves are joined together. By this method much time is saved in setting in place many of the intricate parts, with a resulting saving in cost.

The wings and tails are wooden cantilever structures consisting of two box spars and each covered with a "skin" of plywood. The finished plane is of such sturdy construction that it will not only stand up under the tremendous strains to which it is subjected but will also take a surprising amount of abuse. When flying at 400 miles per hour through

a power transmission line, one would expect that the wings would snap off. One pilot disproved this when he returned with a few hundred feet of wire trailing behind him. In another instance, after a collision with a tree, a flier returned safely home with a hole in the wing as the only result of the mishap.

The many wooden parts going into the plane are made by a number of companies in and around Toronto and flow into the final assembly line at the de Havilland Aircraft of Canada Ltd. plant in suburban Toronto. There are some 120 sub-contractors, including farm implement companies, furniture manufacturers, piano makers, boat builders, and even one of the largest automobile manufacturers.

The Canadian production is on a mass production basis and it is expected that the output at Toronto will be greater than that of the British Mosquito.

WHAT THE FUTURE HOLDS FOR RETAILERS

D. M. LE BOURDAIS

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ANYONE who ventures into the uncertain field of prophecy in these times is probably asking for trouble, but it should at least be possible to foretell the trend of the immediate future. We have now been through four years of war, two of them under fairly rigorous economic controls. The molds of these years have already set the pattern; and any changes likely to occur in the foreseeable future can be expected not to vary greatly from what has happened in the past. In addition to the record of the recent war years, we have the history of the last war. It is true that the national economy in the last war was not involved to anything like the same extent as in this war, but when due allowances are made, the experience of the last war provides a very useful criterion. Then there exist other factors that are inherent in the nature of the situation, war or no war. We shall deal with some of these before passing on to a consideration of those previously mentioned.

In the first place it can be said that, despite the classification given to them by the National Selective Service regulations, retailers perform an essential function in the community. No individual retailer is essential, of course; but the business of retailing very definitely is. The manufacturer or processor may conceivably so equip his plant as to require the very minimum of human help, but he cannot place his product in the hands of the consumer without the retailer's aid. Some few products can be distributed by means of mechanical dispensers, but even they require the intervention of someone who comes within the retail category. Most consumer needs, however, cannot be served in this fashion. Even though the consumer may know quite definitely what he (or, most likely, she) wants, and is quite allergic to the wiles of salesmanship, the merchant or his clerk can, in a great many lines, supply a necessary service to the customer. In some lines, such, for example, as groceries, the function of the retailer is coming more and more to consist of buying, assembling and displaying the goods, while the shopper helps herself to what she requires from the shelves. But even here the retailer has performed the major operations in what is

a very vital factor in the life of the people. The part which the retail merchant plays in our daily lives is so taken for granted that few of us realize how vital it is. In a wartime economy, activities rank in importance and essentiality in accordance with the degree to which they may contribute directly to the war effort. Retailing is not in the front line of such activity; but without the services performed by retailers those who are directly engaged in war production or in the armed forces would find it impossible to carry on. Suffice it to say, then, that the services of retailers will continue to be required, no matter what other services may in the circumstances be later deemed unnecessary. There may be fewer retailers but even in that direction there is a pretty definite limit below which it will not be economically profitable to reduce the number of retail outlets.

This brings us to a consideration of the criteria derived from experience in the last and in the present war. According to figures kindly supplied me by Dun & Bradstreet of Canada Limited, the number of firms in business in Canada—which includes manufacturers and wholesalers as well as retailers—from 1864, when their records began, to the present time, has always been in direct proportion to the population. In wartime a slight increase is shown at the beginning of the war, but declines gradually. After the war the number shoots back to the previous level, and above.

At the end of 1913 there were 146,972 business firms in Canada. In that year 29,942 new businesses were begun and 24,105 were discontinued. By the end of 1914 the total number of firms in business had increased to 150,339, with 28,679 new firms and 25,769 discontinuances during the year. In 1915 the number grew by only 445; and for the first time the number of those going out of business exceeded the number of new businesses; there were 25,383 of the former, and 26,010 of the latter. From 1916 to 1918, inclusive, there was a decline in the total number of firms from 147,757 in 1916 to 139,001 in 1918. The tide turned in 1919, when 142,919 firms were in business and 25,710 new businesses were opened as against 21,653 which closed their doors. Then followed a gradual increase till 1922 when, with a total of 166,435 places of business, a relatively normal level was attained. Thereafter, till the outbreak of the present war, the increase roughly paralleled the increase in population.

The following table shows the number of firms in business at the end of each year 1913 to 1922 inclusive; the number of businesses begun in each year; and the number that were discontinued:

Year	In Business At End of Year	New Firms	Discontinued
1913.....	146,972	29,942	24,105
1914.....	150,339	28,679	25,769
1915.....	150,784	25,383	26,010
1916.....	147,757	21,860	22,878
1917.....	141,709	22,161	23,624
1918.....	139,001	19,539	21,851
1919.....	142,919	25,710	21,653
1920.....	151,203	30,111	24,107
1921.....	160,141	34,450	25,841
1922.....	166,435	33,722	27,610
1923.....	Stationary		

By the end of 1937 the business population had slowly worked up to 173,474, representing a gain in fifteen years of approximately 7,000.

In 1937 business suffered a slump, and this was reflected in the number of discontinuances. By the end of the following year the total was 181,386, which by the end of 1939 had increased by only 116. There was a slight increase during the first year of the war, followed by a steady decline. The table below shows the figures for the years 1940-1942 inclusive, and for the first nine months of 1943:

Year	In Business At End of Year	New Firms	Discontinued
1940.....	182,005	22,991	22,095
1941.....	179,375	20,395	23,025
1942.....	170,215	23,367	14,207
1943 (9 months) ..	165,056	6,040	11,199

Thus from the high point of 182,005 at the end of 1940 there has been a drop in the number of business firms up to September 1943 of 16,949—which means that, at 165,056, the number of businesses in Canada, with a population of approximately 12,000,000, is less than it was in 1922 when the population was only 8,788,500. It will be noticed that while during the last war, from 1916 onward, the number of discontinued businesses outnumbered in each year the ones newly begun, the number of the latter in only one year fell below 20,000, whereas in 1942, out of a total of 170,215 places of business, only 14,207 were discontinued, and but 11,199 in the nine months for which figures are available for 1943.

It will be noted, furthermore, that only 6,040 new businesses have been established in 1943. This, of course, is due to the operation of

Order 284 of the Wartime Prices and Trade Board which, after November 2, 1942, restricted the establishment of new businesses except by special permission of the Director of Licensing, who grants permission only in exceptional cases. Order No. 284 was issued, among other reasons, to protect persons already established in business. It was recognized that with the necessary reduction in the number of different lines of merchandise which could be manufactured and sold, and with the narrower margins of profit, on the average, possible under wartime regulations, it was only fair and just that those already in business should be given every reasonable opportunity to share in the business that was available.

Business failures, while by no means accounting for all discontinuances, provide an index of business stability. In 1914, for example, there occurred in Canada 2,898 business failures. The number decreased during the war years until 1919, when there were only 755. In 1920, however, they jumped to 1,078 and by 1922 had reached a high of 3,695. A similar trend is noticeable in the present war. There were 1,299 failures in 1939; 1,158 in 1940; 882 in 1941; 609 in 1942; and only 190 in the first eight months of 1943. Since experience shows that the greatest percentage of discontinuances occurs among those businesses most recently established, limitation of new enterprises should result in a decrease in the number of firms going out of business—this the above figures would seem to confirm. In other words, while the hazards of business are undoubtedly increased under wartime conditions, the provisions of Order No. 284, to which I have referred, can be counted on to help people to stay in business.

Other regulations, although not as definitely designed for that purpose, do contribute toward helping to keep retailers in business. Consumer Credit regulations are a case in point. Formerly, because of an abundance of goods and under the stress of competition, many articles were sold on extremely long terms, often without any or, at least, with a minimum down-payment. Order No. 225 requires a down-payment of not less than one-third of the amount of the purchase and restricts the term of payment to six months for clothing; ten months on all other goods where the amount financed is less than \$500; and fifteen months where the amount exceeds \$500. The length of time which can be allowed on charge accounts is also regulated. The result of these regulations is that retailers do not need to have so much capital tied up in their businesses; their cash position is much more liquid; they do not lose anything like the same percentages as formerly in bad debts; nor do they have to repossess such a large proportion of

the merchandise sold. Looked at from every angle, the Consumer Credit regulations of the Wartime Prices and Trade Board are a decided advantage to the retailer, and as such can undoubtedly be counted a factor in helping to keep the retailer in business.

Regulations eliminating unnecessary services which for competitive reasons had become established, such as the delivery of merchandise worth less than \$1.00; special deliveries; and refunds and exchanges after certain minimum periods; have also contributed to this end and now save money for the merchant—to say nothing of the saving in vexation.

On the other side of the ledger, of course, is to be charged the additional cost of doing business through inadequate and inexperienced or incompetent staff, and the lower average markup resulting from the disappearance from his shelves of many of the longer-margin items which he formerly counted on to make up for the low level of profits on staple lines. This is a feature of the situation which would cause many merchants greater concern than it is doing at present if their gross sales, through inability to secure merchandise, were to be reduced much below present levels. In most lines of retail business sales are still keeping considerably above pre-war levels; but some lines, notably furniture and hardware, are beginning to fall behind. According to the Dominion Bureau of Statistics, sales by all retail stores in Canada in 1941 amounted to \$3,311,143,800. Sales for the same group in 1942 showed an increase of 13.7% over 1941; while figures for the first seven months of 1943 show a 4.5% increase over the corresponding period of 1942. A considerable proportion of the increased business in 1942 undoubtedly represented sales from inventory, which is no longer possible; and while the average merchant's inventory position is probably less favorable at the present moment than it was a year ago—from the standpoint of actual merchandise on the shelves or in the warehouse—it does not necessarily follow that his net position is worsened thereby. In many cases he has cleared out slow-moving items at good prices which he would formerly have had to sell at a lower markup, or even a loss. It may be that the cash recovered from such sales will merely serve to swell Mr. Ilsley's fund, but that is another story. While in some cases his shelves are becoming bare in spots, they are at least not burdened with many articles which, in other times, he would have bought only as a result of the efforts of enterprising salesmen. It must, on the other hand, be admitted that in the place of the latter he is getting many lines of goods produced under wartime

restrictions which might be more or less a drug on the market were the war suddenly to end.

How are the prospects for retailers securing increased or, at the worst, no smaller stocks of goods in 1944? Whoever can answer that question should also be able to foretell the course of the war in the coming year. But if the war situation does not materially worsen it should not be necessary, in most cases, to reduce supplies of consumer goods below present levels; and in some lines I think the chances are fairly good that quotas might even be increased.

In view of the number of persons who in ordinary times come and go in the retail business, it can be said that retailing is one of the more precarious forms of occupation; the war has added new strains and stresses; consequently it can be expected that some of those least fitted in one way or another will be combed out by the combination of obstacles which the wartime retailer must face. But the net result should be a retail trade, on the whole, much more capable of serving the needs of the people.

In conclusion, I think we can safely say that, assuming that the end of the war is not unduly protracted, the retail trade can count on finding itself in a relatively strong position to face the added competition which can then be expected; for in proportion to population, Canada now has 16,949 less than her normal complement of business firms, the great majority of whom are retailers—and it can be confidently predicted that as soon as people may again open new businesses without restriction the pre-war level will quickly be resumed.

MANAGEMENT MUST CO-OPERATE

J. J. McHALE

President, Scott & McHale, Ltd.

SPEAKING to Vice-President Wallace of the U. S. A., a young man, the son of one of the outstanding men in the Administration at Washington, who at that time was preparing to leave for Overseas to serve his country as a bomber pilot, made the following statement:

It's all baloney to talk about this younger generation winning the peace. We won't come to power for twenty years. The same generation that got us into this mess has got to get us out of it. What really matters is not what new thoughts we kids are thinking, but what new thoughts you older guys are thinking. You'll be writing the ticket."

I think that in the foregoing statement this young man gave expression to an idea that is true beyond the slightest possibility of dispute. In addition it contains a challenge and places on all our shoulders a responsibility that we of the older generation can in no way afford to disregard or fail to accept.

To apply the thought expressed by this young man, we in power must remedy the situation which our blundering has created. In facing this task we must realize also that it is not only the international situation that requires expert attention, but internal conditions within our own nation as well. It is the height of foolishness for us to set about the job of establishing a new world order in which nations can live in peace with each other under fair and just conditions, unless we at the same time establish conditions under which we as individuals can live and work happily and harmoniously amongst ourselves. It is impossible for the sick man to exude health. It is impossible for the grouch to spread happiness about him. It is inconsistent for us to preach brotherly love to other people unless we are prepared to adopt a similar philosophy in our own daily lives. If ever we hope to see the day when the principles of "Freedom from want" and "Freedom from fear" are actually enjoyed by humanity we must, in my opinion, start immediately and set up the machinery by which these benefits can be enjoyed by Canadians in every walk of life. If we become

practical in the application of these ideals we must realize that "Freedom from want" can be obtained only by placing at the disposal of every citizen the means of earning a livelihood at a wage that will afford him a decent standard of living. "Freedom from fear" can be enjoyed by the individual only when conditions are established that will cause him to feel that his means of earning a livelihood is not constantly in jeopardy. I do not believe that any Canadian worthy of the name expects the creation of an order that will support him or his family in reasonable comfort without an effort on his part — in other words, without working. It is the opportunity to work — to receive a just compensation for his labor, and under conditions that will lend dignity to the worker's tasks and an assurance that neither prejudice nor greed will take away from him his employment or the means of supporting himself and those dependent upon him in reasonable comfort — which the average worker demands and by right is entitled to.

Industrial employment problems are difficult, I know. It is not an easy task to maintain workers' incomes at reasonably steady levels, but it must be realized that until some solution is arrived at by which this can be accomplished, comparatively few of us can enjoy "Freedom from want" in the true sense of the word. It is impossible for any man to maintain his home on a wage or salary that fluctuates in an almost indescribable manner from month to month or season to season, from one year to another. It is impossible for him to budget his living expenses with any degree of certainty so that when the time arrives he will have the wherewithal in his pay envelope with which to meet the financial obligations then due. Reasonably satisfactory results, however, can undoubtedly be obtained if those who represent the management end of industry are interested enough to place the humanitarian side of their business on a par with the consideration they must of necessity give to the figures that make up their balance sheets from year to year, and then only if the workers and their leaders are sincere in their efforts to improve the worker's condition and place him on a sound financial footing, and work toward the promotion of peace and harmony in industry rather than chaos and confusion. In other words, instead of working at cross purposes, as labor and management in most instances are doing today, if these two elements adopt a spirit of co-operation and determine that "integrity" will be their watchword in all their dealings with each other, the problem can be solved.

In our own small way, here in Scott & McHale Limited, we have had six successful years, proving beyond peradventure of doubt that

much can be accomplished along these lines. Six years ago, with the co-operation of our workers, we set about developing a plan by which our people would receive fifty-two equal pay cheques throughout the year. For six years we have succeeded in accomplishing this and as a result of the plan established at that time our workers have averaged not fifty-two but fifty-four pay cheques per year of equal size. Likewise at that time I think we adopted the only principle under which industrial workers can enjoy "Freedom from fear," and this was accomplished by voluntarily relinquishing our right of arbitrary discharge of any worker in our plant. During the past six years the disciplinary body in our plant has been a committee of workers elected annually by the workers themselves from amongst their own ranks. No foreman, assistant foreman or executive of any kind has a place on this committee. They are selected entirely from amongst the ranks of the workers themselves and by the workers through a secret ballot.

I have had well-intentioned employers tell me that if they were to give up the right of hiring or firing in their plant their discipline would "go out the window" and they would lose all control of their workers. My answer to this is that during the six years that our plan has been in operation, out of an organization of 300 people we have had exactly two employees before the committee for breach of discipline or for any other cause. What we on the management end of business seem to lose sight of entirely is the spirit of self respect which flames in the minds and hearts of practically all Canadian workers who, if given an opportunity of living their daily lives as free and independent individuals, have too much self-respect in their make-up to violate a trust and a confidence of this kind.

The one and only method by which I believe peace and harmony in industry can be achieved is through management voluntarily granting to labor the position of a partner in business with all of the privileges and certainly all of the responsibilities which such a position entails. If this is done with sincerity on the part of management and is accepted by labor in the same spirit, we would come pretty close to achieving peace within our own nation.

The first step in our program was to set aside a percentage of our sales which represented our operators' just share of every dollar which we receive from our customers in payment for the shoes shipped to them. In our case this amount was 22.2% of every dollar's worth of sales.

The year 1937 was agreed on between us as satisfactory for this

purpose. In this connection I would like to mention that 1937 represented the best year of earnings that our employees had enjoyed since 1929, so that we, the management, can say that the plan has been based on the earnings of a year that was decidedly favourable to our workers. We felt that in order to be successful, the plan must necessarily be based on a foundation that would be lasting, and which would prove to our people that we were acting in a fair and honourable manner and with their interests at heart; otherwise the plan would be doomed to failure from the start.

The amount which this percentage of our sales represents is then credited to a "Labour Reserve Account," and the management of these funds placed exclusively in the hands of an Administrative Committee, elected from the ranks of the workers, by the workers themselves, and responsible only to the workers. This committee administers not only the financial affairs of the workers in our organization but all other matters pertaining to their welfare and the conditions under which they are employed. Certainly management still has its place in the picture but, instead of being a dominating influence, management becomes co-operative with the labour end of the business.

In the administering of the Labour Reserve Account, the employees are divided into three groups, designated as "A," "B," "C".

Into group "A" are placed the older of our employees in point of service. In this connection I might say that at least 85% of our operators are included as group "A" employees. Such employees cannot be laid off while any other group "A" employees are working. They are also entitled to participate in any accrued earnings that may remain in the Labour Reserve Account for distribution at the end of the season. This point will be explained later.

Group "B" employees enjoy all the privileges of group "A" employees except that in slack times they can be laid off, if necessary.

Group "C" represents only the very newest of our employees who are brought in and paid on an hourly rate and who must of necessity go through a period of probation in order that the Administrative Committee and the workers as a whole may have an opportunity of deciding whether or not such new operators are up to the standard which they require in the workers that they will associate with in their future operations.

All group "A" and "B" workers are then given what we term a "basic rate" or "drawing account" — such amounts being computed on

a yearly basis according to the earning power of each individual operator in the business as demonstrated by his or her 1937 earnings, proper adjustments being made in all cases where changes in operator's work had occurred in the meantime. This amount is then paid to each "A" and "B" worker in 52 weekly instalments throughout the year. This does not mean, however, that an operator's drawing account, once determined, is permanently fixed but, on the contrary, the Administrative Committee can and does adjust these amounts as operators improve or are promoted to better paying positions.

It will be of interest to note that under this plan we have voluntarily reduced our work week from 49½ hours to 45 hours, or from 5½ days to 5 days per week. Likewise each "A" and "B" operator is entitled to two weeks' holidays each year, one week to be during the week when Dominion Day, July 1st, falls, and the second week to be during the week in which Christmas, December 25th, falls. Operators receive pay in full not only for these two weeks' holidays but for all of the legal holidays throughout the year, on which they are not required to work, as well as for time lost through no fault of their own.

The total of such drawing accounts is then charged each week against the Labour Reserve Account which, in turn, is credited with 22.2% of the list price of all shoes packed. If at the end of the season there is a balance or surplus remaining in the Labour Reserve Account, such balance is distributed among the operators on a pro rata basis, or in any way the operators themselves should decide to distribute it, the management having no voice whatever in the distribution of these funds. If, on the other hand, business should fall off to a point where sales drop low enough to endanger the drawing accounts of even our group "A" workers being earned through the allocation of the 22.2% of the sales, our agreement provides that under such circumstances the drawing accounts of all the workers shall be reduced to a point to bring such drawings within the actual amounts being earned, so as to keep the amount drawn by the operators within the 22.2% level. Monthly reports are handed to the Administrative Committee showing position of the Labour Reserve Account to date, and these reports are subject to the check and approval of any accredited firm of public accountants engaged by the Committee for that purpose, all records necessary to insure a satisfactory, intelligent audit are open for their inspection.

Our Administrative Committee appreciates and realizes the fact that they have a serious responsibility resting upon their shoulders in the administering of the funds that belong to them and to their fellow

workers. The Committee appreciates to the fullest extent the need of seeing that each and every member of the organization who draws a single dollar from the Labour Reserve Fund earns that amount, and does his or her share towards accumulating any surplus that will be distributed as a dividend to them at the season's end. We have definitely learned that workers will not tolerate a drone or shirker in their midst and pay him or her for work not actually performed, any more than management itself can afford to do so. On the other hand, I can conscientiously say that I know of no operator in our organization who is not filled with a sincere desire to make a satisfactory contribution in the way of work done in return for the amount which they draw in salaries.

It naturally follows that a committee of such workers is not disposed to tolerate unruly or disturbing factors in the organization. It is their responsibility to keep such individuals in line. They likewise realize that, if they are to continue to be masters of their own destinies in this respect, they must be fair and must see that the reasonable orders of the management are carried out to the letter.

Our plan, moreover, provides a system of promotion which enables our operators to make application for any key position that may be open, either in their own or some other department. Under this plan, an operator is not confined to a single department; the opportunities for advancement in the entire plant are open to each and every operator in our organization. Such applications are also handled by our Administrative Committee, and I must say are being handled in a most intelligent way. In every case where an operator has been promoted I have been more than satisfied to give my unqualified approval to the selection made for the position to be filled. In this way operators who have for years worked in a department that does not offer as good opportunity for advancement as does some other department and who, under the old system, did not have a chance of leaving that department and progressing into another, have been given the opportunity of learning a key operation and decidedly improving their financial condition.

The individual interests of each operator are handled with the Administrative Committee by his departmental representative on the Committee. But if an operator has a grievance which he feels has not been properly presented to the Administrative Committee by his departmental representative, he has the privilege of appearing before the Committee and presenting his case in person.

We, the management, are distinctly conscious of a happier, more contented, more accommodating attitude on the part of our workers. This contentment and satisfaction which we are confident our people feel is being reflected from day to day in the quality of our product. Our men and women realize that they are part and parcel of this business; that a certain set portion of it is theirs to be administered by them to their advantage and well-being; that this privilege carries with it a responsibility for discharging in a serious and efficient manner the obligations which rest upon them, and which they must discharge if the plan is to be permanently successful and if they are to continue to enjoy that independence and freedom in their daily lives which this plan assures them.

Experience has taught me that labour as a whole does not demand more than a reasonable share of the income of a business. Most of labour's demands that appear and are considered unreasonable are founded on a lack of knowledge as to what really constitutes a just and fair share of business income. Therefore, why not place labour in a position where it feels assured that it is receiving its proper reward?

Certainly our plan does place greater responsibility on the shoulders of management. To be successful it requires that continuity of operations be reasonably well maintained, and at prices that will enable the workers to obtain a fair return per unit on whatever type of merchandise they may be producing. In our case it is shoes, and we on the management end must see to it that selling prices are maintained at a point that will conform to the purchasing power of the public pocket-book, and at the same time maintain sales in our better grades to a degree that will insure the average price per pair of all shoes sold being high enough so that the percentage allotted for our labour will produce sufficient funds to enable them to work out their problems and make a decent living. Greater care must also be taken in planning and entering of goods into production so as to insure a smooth flow of work through the various departments of the factory, but the results are well worth the added effort.

Nor does our plan permit an employer to profiteer on a rising market at the expense of his employees. Under the old system of piece-work rates generally in vogue, the employer might maintain his labour costs at their present levels and pocket whatever increase he might be able to place on his product without paying corresponding increases to his workers. Under our plan, labour automatically receives its percentage of every penny's worth of increase that becomes necessary to

place on the price of shoes, or whatever the commodity might be, and, reversely if prices, having already advanced, suddenly recede, and it becomes necessary for the management to reduce the price of their commodity in order to meet market conditions, labour, together with management, accepts a smaller amount per unit on the lower selling price than it obtains on the higher selling price.

Thus, fair-minded employers, in good times and on rising markets, when the cost of living generally must advance, need have no worry in paying the increased return to their labour which the higher commodity prices justify, and to which labour is entitled, because when conditions reverse themselves and employers are faced with a falling market, labour automatically under our plan joins hands with them in accepting a lower return for services rendered. Thus the destinies of employer and employee are linked together in a true partnership, whose interests run parallel and become identical, as should always be the case.

The interest of the workers and the interest of the management can never be separated successfully. The well-being of one travels side by side with the other, and it is only when this fact is realized, and employer and employee join hands to work out their problems together, that they will be successful in producing industrial peace and happiness. United together, management and labour can march down the industrial highway of success which stretches before them, and at the end of which they will both find "Freedom from Want" and "Freedom from Fear."

RETAIL MORTALITY, LONDON, ONTARIO

PART I.—INDEPENDENT GROCERY STORES

EDITED BY R. B. WILLIS

Bureau of Business Research, University of Western Ontario

THIS article embodies the results of an investigation of the mortality of retail establishments in the City of London carried on by the class in Statistics, Department of Business Administration, University of Western Ontario, early in 1943. Comprehensive studies of the retail grocery, drug, hardware, men's wear and footwear trades were conducted. In succeeding issues, it is hoped to present the statistics for fields other than grocery.

Explanation of Method Used

The data employed were compiled from an analysis of the telephone directories for London for the years 1932 - 1942 inclusive. Both the regular and yellow pages of the telephone directory were thoroughly scrutinized. All fifteen telephone directories published between these years were used, and it is on these data that the following exhibits were based.

The names of all independent grocery stores in the 1932 directory were written down on the lefthand side of the page, divided into eleven columns — one for each year from 1932 to 1943 inclusive. A check mark was put beside each of these names in the 1932 column. Most of the stores listed in 1933 were also listed in 1932, so all that had to be done was to put a check mark opposite the same name, but this time in the 1933 column instead of in the 1932 column. Any new names appearing in 1933 and in subsequent years were added to the original list and a check mark put opposite each one in the column designated by the year that the name first appeared in the directory. Each name was checked off year by year, unless it ceased to be listed. If this was the case, a blank space was left opposite the name each year that it failed to appear.

Number of Entrances

The figures in Table I. representing the number of entrances in

each year were arrived at by recording and counting the number of stores which appeared during that year, but were not listed the previous year. For example, in 1936 fifty-four new stores were listed in the telephone directory of that year. The names of these stores did not appear in 1936, therefore, they must have been new firms entering the grocery business in the London area. There are several exceptions, however. Some of these stores, listed for the first time, may be new in name only; that is, a store listed under one name in 1935 may have had its name changed. In other cases, the name may not be altered although a change in ownership has occurred. In addition, some exceptionally small stores not having a telephone will not be listed at all in the directory.

For 1932, of course, there is no figure for entrances, since we do not know how many of the names were listed for the first time that year. To solve that problem, we would have to consult the 1931 directory which is not included in the survey. The point of departure then is the number of stores recorded or listed in 1932. In the 1933 directory eight of the 156 names appearing in 1932 failed to appear, but 62 new names were shown. In 1934, 23 new stores were recorded; 12 in 1935; and so on through 1942. The total number of new stores entering the retail grocery field during the period was 288.

Number of Exits

The data representing the number of exits is subject to the same limitations as that for entrances; through changes in name without change in ownership; failure to change name upon alteration in ownership; or failure to possess a telephone.

The number of establishments not listed in 1933 but shown in 1932 was eight. Subject to the qualifications mentioned above, the number of exits from the field in 1932 accordingly was eight. Similarly, 42 retail grocery firms quit business in 1933; 21 in 1934; and so on through 1941.

No figure representing the number of exits in 1942 is shown. This is due to the non-availability of the 1943 directory by the time of the compilation of the study. The total number of exits during the ten years under consideration was 274 — fourteen less than the total number of entrances.

TABLE I.

Comparison of Entrances and Exits of Independent Grocery Stores

1932 - 1942			
Year	Number of Entrances	Number of Exits	Total Number Recorded
1932.....	—	8	156
1933.....	62	42	176
1934.....	23	21	178
1935.....	12	16	174
1936.....	54	25	203
1937.....	17	30	190
1938.....	42	24	208
1939.....	39	59	188
1940.....	7	23	172
1941.....	13	26	159
1942.....	19	—	178
Totals....	288	274	1,982

Compiled from laboratory sheets.

Table I. above shows clearly that the number of exits in 1932 was comparatively small as was likewise the number of entrances. The next year the retail grocery trade absorbed 62 newcomers, of whom two-thirds perished within a year's time of their birth.

What was the cause of such a high increase in the number of new stores coming into the grocery field in 1933 — over that in 1932? This increase can be partially accounted for by the fact that business conditions, in general, improved very noticeably during the first eight months of the year, but took a sudden drop during the last four months. Just as the temporary prosperity at first encouraged many would-be businessmen to venture into the grocery business, similarly did the sudden decline in business activity cause many of the proprietors to close shop and look for some better means of earning a livelihood.

Apparently the prosperity of 1936, as in 1933, caused many optimists to go into business. The business recession during the last months of 1937 forced thirty stores out of business, while only seventeen new ones started up that year. Since the last half of 1938 experienced a business recovery, we find that forty-two new stores were started with only half that number withdrawing.

It is evident that as soon as there is an apparent rise in business activity along with increased employment, many individuals wish to

start a grocery store. Similarly, as soon as a crisis manifests itself, the urge to withdraw manifests itself.

The Effect of the War

The analysis and arguments presented in the foregoing paragraphs regarding the vicissitudes in the retail grocery business pertain chiefly to peacetime business conditions; but we may ask — to what extent, if any, has the war, directly or indirectly, affected the respective numbers of entrances and exits in the grocery field of business?

Beginning in 1939 and continuing through 1941, and undoubtedly through 1942 because of Order 284, the number of exits was decidedly greater than the number of entrances. This, however, is exactly the opposite of what happened under similar conditions in peacetime. Although in 1939 and 1940 we were considered well out of the depression, business activity was increasing, employment rising, and relative prosperity achieved, the number of new outlets decreased. In 1940 only seven entered.

Having regard to the impact of conditions of short supply, the relative attractions of war industry, enlistments by proprietors, problems of manpower, the failure of exits to accelerate after 1939 is noteworthy. Although an abrupt rise in exits occurred in 1939, 1940 and 1941 showed only withdrawals.

TABLE II.

Frequency Distribution of the Length of Life of 288 Independent Grocery Stores in London, 1932-1942

Number of Years of Life	Number of Stores	Per Cent of Total
1.....	108	37.50
2.....	44	15.28
3.....	19	6.50
4.....	13	4.51
5.....	7	2.43
6.....	10	3.47
7.....	4	1.40
8.....	6	2.07
9.....	5	1.73
10 or over.....	72	25.00
	<hr/> 288	<hr/> 100.00

Compiled from laboratory sheets.

The High Mortality Rate of New Stores

Table II. presented above, and Chart II. attached, show that out of a total of 288 new stores entering business during the ten-year period under consideration, 108 (37.5% of total) remained in business only one year or less. The number of stores that managed to operate into the second year, but failed to stay in business until the third year, was 44, or 15.28% of the total. Only six stores of the 288 enjoyed a life of eight years. Those that remained in operation for nine years numbered only five. The remainder, a total of 72 stores (25% of total) stayed in business for ten years or more.

TABLE III.

*Percentage of Grocery Stores Withdrawing from Business
Each Year, 1932 - 1941*

Year	Percentage Withdrawing
1932.....	5.13
1933.....	23.85
1934.....	11.80
1935.....	9.26
1936.....	12.31
1937.....	15.80
1938.....	11.54
1939.....	31.38
1940.....	13.40
1941.....	16.36
<hr/>	
Total	150.83

Average (each year) 15.083%.

Compiled from laboratory sheets.

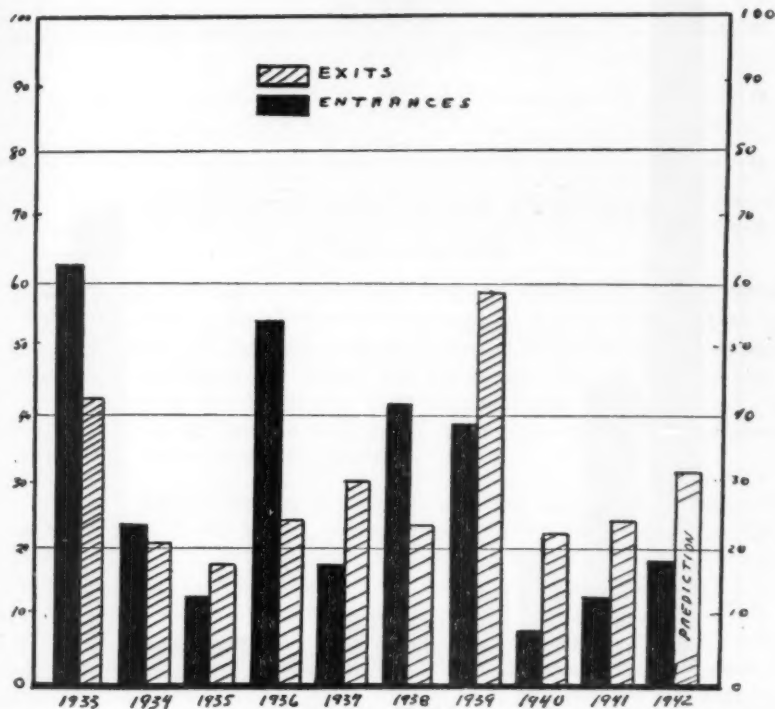
Percentage of Grocery Stores Withdrawing - Table III.

Of all the stores in operation during 1932, 5.13% of them withdrew from business by the end of that year. In 1933, the percentage of withdrawals was much higher, but this was partly due to the large number of entrances that year. Since the death rate among new stores is high, the large number of entrances in 1933 would contribute materially to the increase in the number of withdrawals the same year.

During the next five years the percentage of withdrawals remains fairly constant around 11%, with the exception of 1937, when it reached

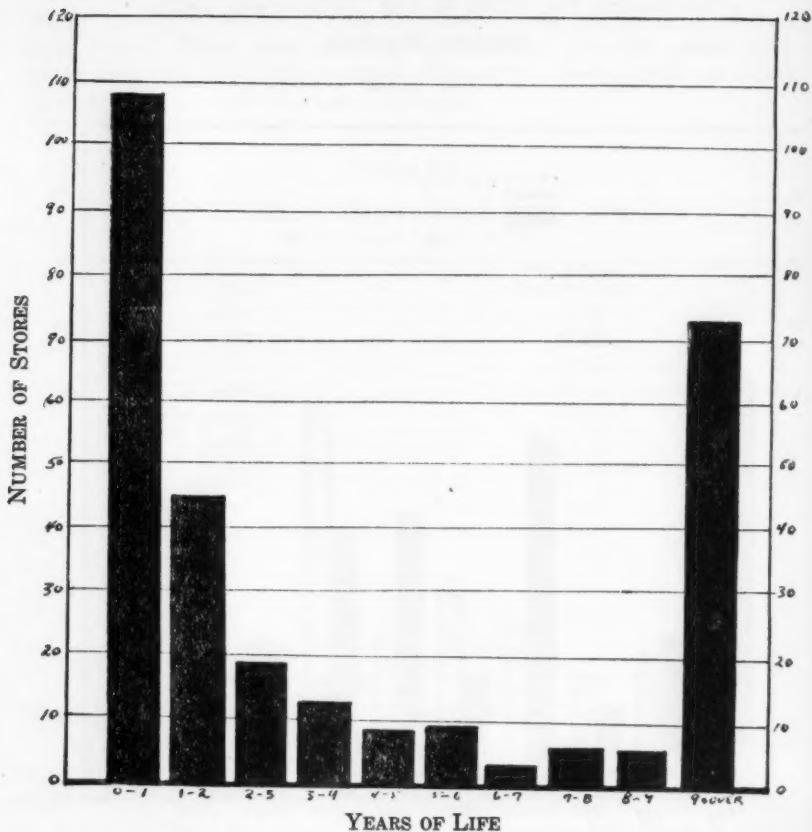
15.8%. Beginning in 1939, the figures jumped to 31.38% when 59 stores withdrew. During 1940 the percentage of withdrawals dropped to 13.40% of the number recorded.

CHART I.
ENTRANCES AND EXITS IN THE INDEPENDENT RETAIL
GROCERY BUSINESS
1933 - 1942



Source — Laboratory Sheets.

CHART II.
FREQUENCY DISTRIBUTION OF THE LENGTHS OF LIFE OF
288 INDEPENDENT RETAIL GROCERY STORES IN LONDON
1932 - 1942



Source — Laboratory Sheets.

